Name of Organization: County of Ottawa

Type of Organization: County

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Project Title: Constructed Wetlands Treatment of Animal Livestock Waste

Project Category: Emerging Issues

Rank by Organization (if applicable): 0

Total Funding Requested ($): 109,250 **Project Duration:** 2 Years

Abstract:

The Ottawa County Planning Commission, through its Water & Environment Subcommittee (WES), has been working to address issues related to the disposal of intensive animal livestock waste in Ottawa County, Michigan.

The Planning Commission has initiated a Smart Growth Demonstration Project to proactively resolve, among other things, land use problems that result from mixing agriculture and residential development. This project will assist local units of government with their agricultural preservation efforts; but it will not resolve most of the existing conflicts that are related to odors or the perceived environmental impacts of agricultural waste.

In an effort to address specific agricultural odor and environmental issues, the Planning Commission and the Ottawa County Michigan State University Extension Office (MSUE) are proposing to implement a demonstration project which will utilize an ecological, cost effective, and low maintenance treatment system known as a constructed wetlands/reed bed. It is our intent to demonstrate that this system will reduce nutrient loadings and detectable odors that are associated with swine and/or dairy livestock operations.

Geographic Areas Affected by the Project

States:

- [ ] Illinois
- [ ] Indiana
- [x] Michigan
- [ ] Minnesota
- [ ] New York
- [ ] Pennsylvania
- [ ] Wisconsin
- [ ] Ohio

Lakes:

- [ ] Superior
- [ ] Huron
- [x] Michigan
- [ ] Erie
- [ ] Ontario
- [ ] All Lakes

Geographic Initiatives:

- [ ] Greater Chicago
- [ ] NE Ohio
- [ ] NW Indiana
- [ ] SE Michigan
- [ ] Lake St. Clair

Primary Affected Area of Concern:

Other Affected Areas of Concern:

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

The Ottawa County Planning Commission, through its Water & Environment Subcommittee (WES), has been working to address issues related to the disposal of intensive animal livestock waste in Ottawa County, Michigan.

The Planning Commission has initiated a Smart Growth Demonstration Project to proactively resolve, among other things, land use problems that result from mixing agriculture and residential development. This project will assist local units of government with their agricultural preservation efforts; but it will not resolve most of the existing conflicts that are related to odors or the perceived environmental impacts of agricultural waste.

Ottawa County is the ninth largest county in Michigan and is presently the fastest growing of all counties with populations greater than 200,000. Ottawa County's estimated population is presently 215,000 and is expected to reach 270,000 by the year 2010.

Ottawa County is also ranked as the State's largest overall agricultural producer (#1 poultry, #4 swine, #4 cattle and calf) by the Michigan Department of Agriculture. As the County's population continues to grow, and residential development continues to expand, Ottawa County's agricultural livestock production continues to rise even though available agricultural lands diminish. One of the more serious effects of population expansion into agriculture areas like Ottawa County is the reduction of the amount of available land to which farmers can agronomically apply manure nutrients. This situation results in increased citizen complaints regarding livestock odors and the agricultural operation's perceived contribution to non-point source pollution.

Proposed Work Outcome:

Presently, the Planning Commission and the Ottawa County MSUE have been studying an innovative, natural, waste treatment system that utilizes "constructed wetlands". This system could potentially eliminate odors, and reduce nutrient levels in animal waste to agronomic levels - and because of its "natural" design, the system generally has low maintenance and operational costs.

A constructed wetlands can be used to treat a variety of waste streams including septage, industrial, stormwater, and leachate (landfill). The advantages of a natural treatment process are as follows: lower construction, operating, and maintenance costs; chemical-free treatment; aesthetically pleasing treatment area; and high-quality treated water. A typical constructed wetland consists of a lined rock bed which is planted with a variety of scientifically chosen plant species. Wastewater flowing into the cell is treated through biochemical processes facilitated by plants and microorganisms within the wetland. Agronomic levels of water and nutrients are then applied to the soil for plant utilization.

In addition, manure solids are continually applied to a series of reed beds on a daily basis. The daily application reduces anaerobic digestion and the reeds efficiently introduce oxygen into the sludge. This process is highly effective in oxygenating and drying sludge which results in very minimal odors.

The measurable objectives of the project are to eliminate off-site odors; reduce nitrates, phosphorous, and potassium to agronomic levels; determine the exact economic cost of system(s); and determine the movement and transformation of nutrients (N, P, K).

In order to demonstrate the feasibility and effectiveness of this natural technology, a Constructed Wetland Proposal was initiated in 1998. Ottawa County provided funding for a feasibility study, and a swine farm was selected to participate in a demonstration project. Based upon the feasibility study results, it is our belief that this technology will eliminate odors, reduce perceived environmental implications, and enhance the operation and sustainability of intensive livestock farms - even in regions where expansive residential development has occurred.

It is our intention to demonstrate the potential benefits of this wetlands technology by constructing an operating system on a swine farm in Blendon Township, located in the mid-southern portion of the County.

Project Milestones:	**Dates:**
Final Engineering	06/2000
Treatment System Construction	09/2000
Kickoff Press Conference	09/2000
Waste Treatment Commences	06/2001
Fully Operational - Assesment Commences	09/2001
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☐ Project Addresses Environmental Justice

If So, Description of How:

☒ Project Addresses Education/Outreach

If So, Description of How:

If the system proves to be successful, educational programs will begin to educate farmers about the benefits and costs of implementing a system.

Project Budget:

	Federal Share Requested ($)	Applicant's Share ($)
Personnel:	0	0
Fringe:	0	0
Travel:	0	0
Equipment:	0	0
Supplies:	0	0
Contracts:	0	0
Construction:	109,250	5,750
Other:	0	0
Total Direct Costs:	109,250	5,750
Indirect Costs:	0	0
Total:	109,250	5,750
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

Description of Collaboration/Community Based Support:

The project will be performed in collaboration with the Ottawa County Michigan State University Extension Office.